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Priority Outcomes in Sickle Cell Disease Treatment: Co-Creation and Implementation of a Preference Exercise With Patients and Caregivers to Inform Drug Development

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Abstract

Involving patients as co-leaders and co-creators in research is key to reflecting the patient's voice in decision-making. However, co-creation of patient-centered data to inform decisions is rare, especially in early drug development where patient input is critical to prioritizing patient-relevant outcomes and endpoints for use in clinical trials. Despite the industry's growing commitment to patient centricity, most patients are excluded from sharing their expertise in research; more inclusive methods of engaging patients as research partners are needed. We describe a collaboration between a pharmaceutical company and a patient organization in co-leading and co-creating a program to understand priorities of patients and caregivers for treatment features and outcomes in sickle cell disease to inform endpoint selection in clinical development. The results of this program will be used as a basis for continued interaction between patients and the sponsor and to inform ongoing clinical development and evidence-generation activities. This case study demonstrates an approach to meaningful collaborations between patient organizations and pharmaceutical companies aimed at including the patient's voice early in the medical product lifecycle.

Keywords

community engagement, medical decision-making, medications/adherence, patient engagement, patient perspectives/narratives, quantitative methods, survey data

Key Points

- Patient-centered co-creation of data can be conducted at any point in the medical product lifecycle from discovery and design through post-marketing.
- Research partnerships that ensure patients participate as co-leaders in research and have an active role in decision-making can be used to overcome practices that exclude patients from sharing their expertise in a disease area and promote patient leadership in the co-creation of patient-centered data.
- Building trust between patients and researchers requires that: (a) the content of the research is co-created so that it reflects what matters to patients, (b) the patient organization can determine the methods for outreach, communication, and enrollment that are most appropriate, (c) the results are communicated to the patient community in a form that is understandable and useful, and (d) sufficient resources are provided to the patient organization to execute the program.

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- Research partnerships can improve health equity for the patient community by driving partnerships with community-based organizations and utilizing community-health workers who are engaged with patients and families in healthcare.
- Meaningful involvement and genuine commitment to listening to and incorporating diverse patient feedback and ideas into decision-making processes may improve patient outcomes, product innovation, and trust between patients and the healthcare industry.

Introduction

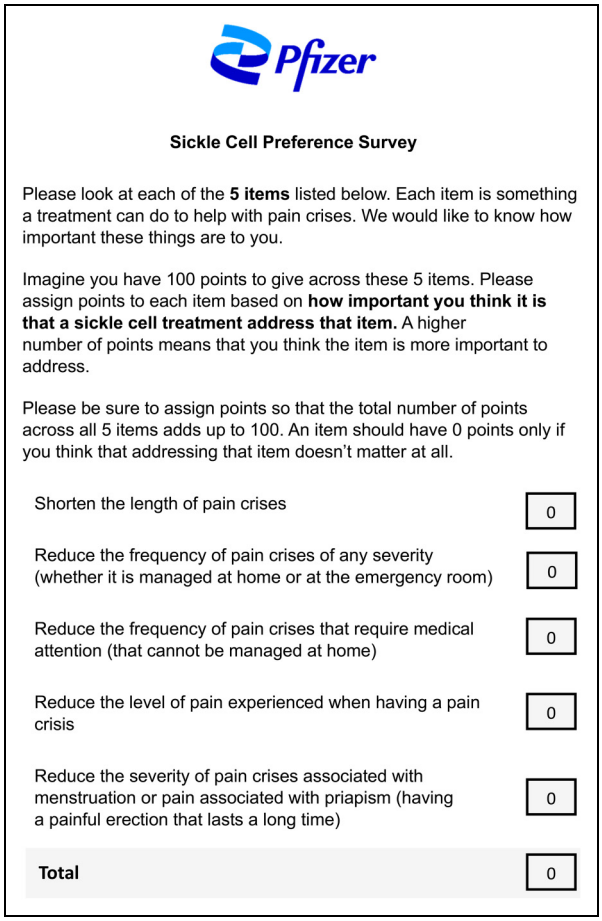
Patient-centered health research is necessary to meet patients' needs, increase diversity in clinical trials, promote health equity in data collection, and inform decision-making throughout the medical product lifecycle.[1,2,3] Effective patient-centered health research is built on principles of respect, equity, trust, and empowerment,[4] and requires continued engagement and co-creation of data with patients.[5] A case study of collaboration between a pharmaceutical company (Pfizer) and a patient group (Sick Cells) in developing, conducting, and disseminating the results of a patient preference evidence-generation program in the United States is presented as a model of effective patient engagement in health research during early clinical development.

Method

Although including patient insights in drug development is essential to developing therapies that meet sickle cell disease (SCD) patient needs,[6] no studies exist which quantify the importance of treatment features or outcomes to patients with SCD or caregivers of patients with SCD. The objective of the program was to generate evidence of the importance patients and caregivers place on treatment features and outcomes to inform the early development of novel SCD therapies.

To achieve this objective, patients and caregivers were asked to complete multiple online point allocation (PA) exercises.[7,8] In each exercise, participants were presented with a set of SCD treatment features and asked to assign points to each feature indicating how important they thought it was that an SCD treatment address that feature. More points indicated stronger preferences and the total number of points across all features was equal to 100 (Figure 1, Supplemental Material). Twenty-seven features (Table 1) were evaluated across five PA exercises. A sixth exercise was used to weight the most important features in the five PA exercises so data could be combined across PA exercises.

An initial list of 22 features was developed by the sponsor to include candidate endpoints for clinical trials, modes of administration, and adverse events associated with SCD treatments. The list was modified by representatives from the patient group to ensure that all features in the list were meaningful to patients and caregivers and that all important features were included in the exercise. For example, daily chronic pain and fertility concerns were not included initially; however, the patient group indicated that addressing these concerns is important to patients. Therefore, reducing daily chronic pain and reducing the risk of fertility issues were included in the list of features. The final list was developed using an iterative process between the sponsor and the patient group. A training video, which was recommended by the patient group to improve participant understanding of the exercise, was also included.


Pfizer

Sickle Cell Preference Survey

Please look at each of the **5 items** listed below. Each item is something a treatment can do to help with pain crises. We would like to know how important these things are to you.

Imagine you have 100 points to give across these 5 items. Please assign points to each item based on **how important you think it is that a sickle cell treatment address that item.** A higher number of points means that you think the item is more important to address.

Please be sure to assign points so that the total number of points across all 5 items adds up to 100. An item should have 0 points only if you think that addressing that item doesn't matter at all.

Shorten the length of pain crises	0
Reduce the frequency of pain crises of any severity (whether it is managed at home or at the emergency room)	0
Reduce the frequency of pain crises that require medical attention (that cannot be managed at home)	0
Reduce the level of pain experienced when having a pain crisis	0
Reduce the severity of pain crises associated with menstruation or pain associated with priapism (having a painful erection that lasts a long time)	0
Total	0

Figure 1. An example of a PA exercise in the sickle cell disease survey.

The patient group recruited participants through their network of US community-based organizations (CBOs) that provide support services to families living with SCD (Figure 2). This community-based recruitment utilized the expertise of trained community health workers and social workers to act as a bridge between researchers and patients. Because the CBOs had existing relationships within their local communities, they could contact patients and caregivers who reflected the diversity of the population, paying particular attention to those often underrepresented in SCD research. The CBOs were trained by the patient group to screen interested participants and direct them to the online exercise. All

Table 1. Importance Weights for Sickle Cell Disease Treatment Features and Outcomes.

Items a sickle cell disease treatment can address	Importance score	
	Patient (n = 26) Mean (SD)	Caregiver (n = 23) Mean (SD)
Reduce the risk of having organ damage (including damage to the liver, heart, kidneys, gallbladder, or eyes)	6.32 (6.13)	5.32 (3.36)
Shorten the length of pain crises	5.55 (3.89)	5.34 (3.98)
Reduce the risk of having a stroke (including strokes that don't have any noticeable symptoms)	5.22 (3.27)	4.65 (2.56)
Reduce the risk of severe joint problems in the hip or shoulder (avascular necrosis/ AVN)	4.78 (2.64)	3.74 (1.98)
Reduce the frequency of pain crises of any severity (whether it is managed at home or the emergency room)	4.63 (2.76)	5.82 (3.81)
Reduce the frequency of pain crises that require medical attention (that cannot be managed at home)	4.61 (2.55)	5.62 (5.24)
Reduce the risk of acute chest syndrome (when sickled cells clump together in the lungs)	4.61 (2.18)	4.79 (2.48)
Reduce the level of pain experienced when having a pain crisis	4.5 (2.78)	5.92 (3.78)
Less chance having myelosuppression (bone marrow problems cause fewer red blood cells, fewer white blood cells, and fewer platelets than normal and can cause fatigue, shortness of breath, bleeding and infections)	4.19 (3.43)	3.82 (3.97)
Reduce daily chronic pain	4.11 (2.83)	4.32(2.11)
Reduce the risk of kidney damage	4.09 (3.07)	3.49 (2.09)
Reduce need to use opioids to treat pain	4.03 (3.04)	4.23 (2.58)
Increase hemoglobin levels	3.95 (3.50)	3.33 (1.86)
Reduce fatigue (tiredness that doesn't get better after sleep)	3.67 (2.81)	3.01 (1.59)
Not needing to taking oral pills or tablets every day	3.41 (2.42)	2.25 (1.6)
Improve ability to do normal daily activities	3.35 (2.49)	3.95 (2.27)
Less chance that the treatment will stop working over time	3.24 (2.45)	3.9 (2.56)
Increase oxygen while sleeping which can help the body rest	3.19 (2.14)	2.95 (2.05)
Reduce the risk of getting a painful wound in your lower leg that won't heal (leg ulcer)	2.95 (1.89)	2.31 (1.76)
Reduce severity of pain crises associated with menstruation or pain associated with priapism (having a painful erection that lasts a long time)	2.83 (2.27)	2.21 (1.76)
Reduce risk of having fertility issues (including low sperm count or inability to get pregnant)	2.80 (1.78)	2.45 (1.61)
Reduce need for transfusions and risk of iron overload	2.79 (1.88)	4.16 (2.49)
Reduce risk of headaches and problems thinking or concentrating	2.74 (1.82)	2.93 (1.63)
Less chance of having nausea, vomiting, or diarrhea because of the medicine	2.51 (1.62)	2.61 (1.53)
Reduce the risk of getting a burning feeling, cramps, and weakness in muscles	2.48 (2.14)	2.57 (1.65)
Less redness and swelling at the location where the medicine is injected	1.81 (1.44)	1.52 (0.90)
Not needing to get an injection under the skin at home every 2 weeks	1.66 (1.19)	2.82 (2.20)

Abbreviation: SD = standard deviation.

participants provided online consent to participate after being informed of the sponsor's adverse-event reporting obligations, how data would be handled, and how confidentiality would be assured. Participants were informed of the identity of the survey sponsor; the sponsor was blinded to participants' identities. The patient group provided an electronic gift card ($100) to each participant. After the data were analyzed, the sponsor and patient group jointly developed a plain-language summary for patients and caregivers, describing the results.

Results

Forty-nine people (26 patients and 23 caregivers) participated in the exercise. The majority (69%) of patient participants were female. The majority of caregivers (52%) were providing care for a male patient. Over 90% of patients and patients being cared for were Black or African American and 10% were Hispanic or Latino. The majority of patient participants (56%) were <35 years old and the majority of patients being cared for (79%) were <18 years old. Characteristics of participants are summarized in the Supplemental Material. Importance weights for all features are presented in Table 1.

For patients, the most important features were reducing the risk of end-organ damage and reducing the duration of vasoocclusive (ie, pain) crises. For caregivers, the most important features were reducing the severity of pain during pain crises and reducing the frequency of pain crises. For both groups, the least important features were reducing the risk of headaches and cognitive problems and

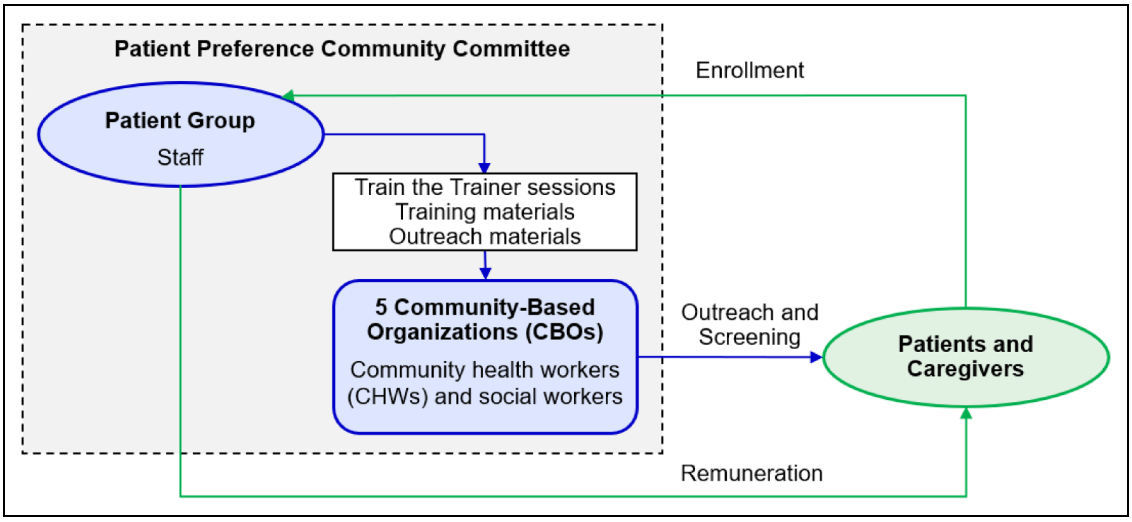


Figure 2. Recruitment process led by the patient group.

reducing gastrointestinal side effects. In contrast to patients, caregivers placed much greater weight on reducing the need for transfusions.

Discussion

Quantitative data on treatment priorities of people with SCD is limited. In addition, many patient preference studies are conducted only after a medicinal product is developed and the potential outcomes and product features are well understood. At this point it is too late to inform clinical trial endpoint selection. This collaborative approach to understanding preferences for treatment features and outcomes in SCD provides a good example of how drug manufacturers and patient organizations can partner to ensure that the patient voice is incorporated in early development in a meaningful way. Partnerships between sponsors and patient groups and between patient groups and CBOs promote health equity, build trust and can increase participation in research by patients who may otherwise be excluded from sharing their expertise. This type of partnership demonstrates how to balance what is clinically feasible with what is necessary from a patient-centered perspective. The patient group was actively involved in the development of the patient-preference exercise, ensuring that it was understandable and accessible to all patients and included all treatment features and outcomes that matter to patients. The patient group determined how best to recruit and screen participants, ensuring that they had the opportunity to engage with multiple CBO partners and could speak directly to participants throughout the process while ensuring that no personally identifiable information was available to the sponsor. Finally, the sponsor and patient group developed a plain-language summary of the results that could be shared with CBOs, participants, and the broader SCD community, ensuring continued patient engagement.

Patient engagement can help pharmaceutical companies better understand patient priorities which can lead to the development of products that better serve patient needs. This, in turn, may lead to improved patient outcomes and satisfaction. Meaningful patient involvement in decision-making throughout the medical product lifecycle can benefit pharmaceutical companies in additional ways. Engaging with patients throughout the lifecycle provides new insights, leading to more innovative healthcare solutions. Regulatory agencies encourage increased patient engagement by industry throughout the medical product lifecycle. In addition, engaging patients earlier in clinical development may result in financial benefits to sponsors.[9]

After the program was completed, the participating CBOs completed an 8-question survey. CBOs indicated that their reasons for participating in this process included providing community members with opportunities to contribute to research, building the CBO's research capacity, and building partnerships with other community organizations. CBOs indicated that the partnership with the patient group provided positive outcomes for their organizations, including connecting local organizations with the broader SCD community and helping them gain insight into the diversity of their clients through their participation in recruitment efforts. In addition, most CBOs agreed that they were able to address any fear, mistrust, or questions about participation in this program from their communities. These findings indicate that the collaboration of a large pharmaceutical company and a national patient organization can have local benefits if local organizations are involved.

Limitations

There are methodological limitations to interpreting the numeric results. This exploratory exercise involved a small number of patient and caregiver participants. The standard

deviations surrounding the importance weights were large and may be a result of the small sample size, an artifact of the PA method, or reflect heterogeneity in preferences among participants. Finally, patient participants were ≥18 years of age and caregivers cared primarily for patients <18 years of age. If treatment priorities differ based on age, the results from patients and caregivers may not be directly comparable. From a patient engagement perspective, there are two primary limitations. First, a brief guide providing additional instructions or information about the exercise may have reduced the burden on CBOs who recruited participants. In addition, while the patient group was actively involved in the development of the survey, it may also have been helpful to have greater direct patient input into the process.

Conclusion

Meaningful collaborations between patient organizations and pharmaceutical companies to include the patient voice early in the medical product lifecycle is possible provided that: (a) the content of the research is co-created to ensure that it reflects what matters to patients, (b) the patient organization can determine which methods for outreach, communication, and recruitment are most appropriate, (c) the results are communicated to the patient community in a form that is understandable and useful, and (d) sufficient resources are provided to the patient organization to execute the work.

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Ethical Statement

This collaboration was conducted as a market research program under Pfizer's internal procedures for Customer Engagement Programs. Each participant was provided with a description of the PA exercise (including the purpose), was informed about required adverse event reporting procedures and confidentiality, and was asked to provide consent before participating. During the engagement, personally identifying information was not collected and free-text boxes were not included in the exercise. Invitations to participate were sent to participants who indicated to the CBOs that they were interested in participating using a no-reply email. Participants were made aware of Pfizer's role as the sponsor of this engagement, but the identities of all participants were blinded to Pfizer. Copies of the introductory text regarding adverse-event reporting, confidentiality, and participant consent are available from the corresponding author upon request.

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Supplemental Material

Supplemental material for this article is available online.

References

1. de Wit M, Cooper C, Reginster JY; WHO-ESCEO Working Group. Practical guidance for patient-centred health research. *Lancet*. 2019;393(10176):1095-6.
2. van Overbeeke E, Whichello C, Janssens R, et al. Factors and situations influencing the value of patient preference studies along the medical product lifecycle: a literature review. *Drug Discov Today*. 2019;24(1):57-68.
3. Whichello C, Bywall KS, Mauer J, Watt SJ, Cleemput I, Pinto CA, et al. An overview of critical decision-points in the medical product lifecycle: where to include patient preference information in the decision-making process? *Health Policy*. 2020;124(12):1325-32.
4. Harrison JD, Auerbach AD, Anderson W, et al. Patient stakeholder engagement in research: a narrative review to describe foundational principles and best practice activities. *Health Expect*. 2019;22(3):307-16.
5. Kaisler RE, Missbach B. Co-creating a patient and public involvement and engagement 'how to' guide for researchers. *Res Involv Engagem*. 2020;6:32.
6. National Academies of Sciences, Engineering, and Medicine. *Addressing sickle cell disease: a strategic plan and blueprint for action*. The National Academies Press; 2020.
7. Stolker JM, Spertus JA, Cohen DJ, et al. Rethinking composite end points in clinical trials: insights from patients and trialists. *Circulation*. 2014;130(15):1254-61.
8. Taylor PC, Betteridge N, Brown TM, et al. Treatment mode preferences in rheumatoid arthritis: moving toward shared decision-making. *Patient Prefer Adherence*. 2020 Jan 20;14:119-31.
9. Levitan B, Getz K, Eisenstein EL, et al. Assessing the financial value of patient engagement: a quantitative approach from CTTI's patient groups and clinical trials project. *Ther Innov Regul Sci.* 2018;52(2):220-9.

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Ashley Valentine is Co-founder & President at Sick Cells, leading the organization's mission to elevate the voices of the sickle cell disease (SCD) community and their stories of resilience and highlight the grave disparities this community faces.